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COMPARISON OF PEPPERMINT AROMATHERAPY AND STANDARD THERAPY ON THE QUALITY OF LIFE OF PREGNANT WOMEN WITH EMESIS GRAVIDARUM

Perbandingan Aromaterapi Peppermint dan Terapi Standar terhadap Kualitas Hidup Ibu Hamil dengan Emesis Gravidarum

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ABSTRAK

Mual muntah selama kehamilan trimester I dapat terjadi sepanjang waktu dan menyebabkan kualitas hidup menurun. Penelitian ini bertujuan untuk membandingkan terapi standar dan aromaterapi peppermint terhadap kualitas hidup ibu hamil trimester I. Desain penelitian kuasi eksperimen menggunakan kelompok kontrol. Pre dan pos tes dihitung pada kedua kelompok. Terapi standar diberikan kepada kelompok kontrol dan aromaterapi peppermint diberikan kepada kelompok intervensi dengan jumlah sampel tiap kelompok 30 orang. Pemilihan subjek menggunakan simple random sampling dengan kriteria inklusi ibu hamil usia kehamilan 6-20 minggu dengan mual muntah ringan dan sedang, memiliki indra penciuman yang normal, tidak ada penyakit yang berhubungan dengan pencernaan, tidak ada masalah kesehatan mental, tidak memiliki riwayat penyakit berat, tidak ada penyulit kebidanan, tidak mengkonsumsi alkohol, serta tidak merokok. Analisis data dengan Uji Mann Whitney dan uji Mc Nemar. Hasil penelitian menunjukkan terdapat perbedaan signifikan dalam skor kualitas hidup ibu hamil antara kelompok kontrol dan intervensi. Skor kualitas ibu hamil berbeda secara signifikan pada hari ke-4 pemberian aromaterapi peppermint. Simpulan pada penelitian ini, kualitas hidup pada terapi standar lebih tinggi daripada kelompok intervensi. Penambahan waktu intervensi direkomendasikan untuk hasil yang lebih valid.

***Kata kunci**: aromaterapi peppermint, kualitas hidup, ibu hamil*

ABSTRACT

Nausea and vomiting during the first trimester of pregnancy can occur at any time and cause a decrease in quality of life. This study aims to compare standard therapy and peppermint aromatherapy on the quality of life of pregnant women in the first trimester. The study design is quasi-experimental using a control group. Pre- and post-tests were calculated in both groups. Standard therapy was given to the control group and peppermint aromatherapy was given to the intervention group with a sample size of 30 people per group. Subjects were selected using simple random sampling with the inclusion criteria of pregnant women aged 6-20 weeks with mild to moderate nausea and vomiting, a normal sense of smell, no digestive diseases, no mental health problems, no history of serious illnesses, no obstetric complications, no alcohol consumption, and no smoking. Data analysis used the Mann-Whitney test and the McNemar test. The results showed a significant difference in the quality of life scores of pregnant women between the control and intervention groups. The quality scores of pregnant women differed significantly on the 4th day of peppermint aromatherapy administration. In conclusion, this study shows that the quality of life in the standard therapy group is higher than in the intervention group. Increasing the intervention time is recommended for more valid results.

Keywords: peppermint aromatherapy, pregnant women, quality of life

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INTRODUCTION

Approximately 70% of pregnant women worldwide experience emesis gravidarum of varying severity. Complications of hyperemesis gravidarum occur in 1.1% of the population. Emesis gravidarum can be a significant burden on healthcare budgets.[1] Recent research suggests that a combination of the hormone hCG and psychological factors are independently affected nausea in first trimester.[2]

Quality of life of pregnant women affecting by several factors, including IVF programs, smoking during the months before pregnancy, sexual violence or domestic violence depression during pregnancy anxiety, stress, difficulty sleeping, a history of alcohol dependence, nausea, obesity, complications before or during pregnancy, back pain, epigastralgia and vomiting.[3]Psychological and hormonal factors are associated with the severity of emesis gravidarum. The βHCG hormone levels are more than 49950 mui/dL and multigravida are dominant factors affecting hyperemesis gravidarum.[4] In this study, mental health problems, alcohol consumption and obstetric complications were excluded, because they could be confounding factors.

Management of emesis gravidarum can include pharmacological and non-pharmacological therapies.. Alternative non-pharmacological therapies that have been studied include acupressure, acupuncture, vitamin B6, ginger, chamomile, mint oil, and lemon oil.[5] A study measured the economic impact of nausea and vomiting during pregnancy.

The cost of treating nausea and vomiting is approximately US$1.8 billion. This cost is based on the lowest retail price. This estimate does not include other prescribed medications and vitamins, as well as dehydration treatment.Evidence-based interventions for nausea and vomiting are still needed.[6]

In research using pre-experimental methods, it was found that peppermint oil reduced nausea and vomiting more than lavender oil.[7]Peppermint oil is one intervention that still requires a lot of research.[8] Emesis in cancer patients who has chemotherapy can be treat by Peppermint oil. Peppermint oil intervention was less expensive, safer, and more effective in treating emesis.[9] A case-control study was conducted in Turkey in 2018 at the general hospital. The study involved 150 who suffer hyperemesis gravidarum and 150 women with healthy pregnancies. The results showed that hyperemesis gravidarum negatively impacted quality of life. Maternal response to pregnancy is influenced by the severity of hyperemesis gravidarum and low quality of life.[10]

In Indonesia, research on the effects of peppermint oil on pregnancy has been published in several articles, but the sample studied was around 15 study subjects.[11]The study did not use a control group and did not measure the health related of quality of life. This study differs from previous studies in that it used a sample size of 60 study subjects, with a control group. Our study aims to compare peppermint aromatherapy and standard therapy on the quality of life of pregnant women in the first trimester with emesis gravidarum. The quality of life measured in this study was the mother's physical and psychological comfort level during nausea and vomiting.

METHODS

The research method was quasi experiment with a control group. Pre-tests and post-tests were conducted after the intervention. Total sample was 60 pregnant women. Inclusion criteria were pregnant women of Indonesian citizenship aged 18-35 years, able to read and write, with a 24-hour PUQE (Pregnancy Unique Quantification of

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Emesis) score ranging from 3-12 or mild to moderate nausea and vomiting before the intervention. Gestational age was 6-20 weeks, calculated based on ultrasound or the first day of the last menstrual period, did not have problems with the sense of smell, did not use antiemetic drugs in the 24 hours before the start of the study, did not have obstetric complications, the results of the anamnesis showed no history of serious illness, was not currently suffering from digestive-related diseases, did not smoke or consume alcohol, did not have mental health problems.

Exclusion criteria included subjects with peppermint aromatherapy intolerance, subjects with a score of ≥ 13 on the PUQE questionnaire (severe nausea and vomiting), imminent abortion, consuming chemical drugs or herbal antiemetics other than standard therapy (Vitamin B6), and unwillingness to participate in the study. The PUQE is a standardized instrument that is often used to determine the severity of emesis then the progress of treatment can be tracked.

Sampling was conducted using simple random sampling. Each group consisted of 30 participants in the treatment and control groups, using lottery numbers 0-60. Numbers 0-30 were assigned to the peppermint aromatherapy group (X), while numbers 31-60 were assigned to the standard therapy group (Y). Study selection with exclusion and inclusion criteria was conducted to avoid bias in the study. The study was conducted at a Community Health Center in Klaten Regency from January to September 2023.

Intervention with the administration of essential oil extracted from Mentha piperita. Aromatherapy uses products already on the market produced in the USA, has been certified 100% essential oil, does not contain alcohol, certified food grade, FDA and BPOM. Product Grade qualification A+ (International standard) with a standard high-tech cold pressing and distillation process so that the nutritional content in the oil remains fully maintained. BPOM permit no. NA 18220601242. Although this ingredient does not have halal certification from MUI, but based on the information on the ingredients, this product does not contain alcohol. The essential oil is dropped on a cotton bud or tissue as much as 3 drops, placed 1 cm in front of the nose. Respondents must take 3 deep breaths through the nose. The essential oil is inhaled when the mother feels nauseous, done for 4 days by the mother herself. Each day a maximum of 4 administrations. Enumerators monitor compliance with aromatherapy administration by communicating via WhatsApp or telephone. Emesis instruments were measured by 24-hour PUQE questionnaire.[12]In the control group, study subjects were given standard therapy with vitamin B6. By dividing the groups into two groups, differences in quality of life between aromatherapy and standard therapy could be analyzed. Quality of life was measured by Visual Analogue Scale (scale 0-100). VAS interpretation: Score 0 (very bad condition), score 100 (good condition as before pregnancy). The Health-Related Quality of Life questionnaire was measured for quality of life.[13]Data analysis was conducted using univariate and bivariate analyses. This study has received ethical approval from the Health Research Ethics Committee of Kusuma Husada University, Surakarta, under registration number 1454/UKH.L.02/EC/VII/2023.

RESULT

The following presents the characteristics of the research subjects in Table 1.

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Table 1. Characteristics of Research Subjects Based on Age, MUAC and Pre-Pregnancy BMI

Variables	Control (n=30)	Intervention (n=30)	p
Age	27.4 ± 4.2	28.2 ± 4.2	> 0.001*
MUAC (cm)	24.8 ± 2.5	25.2 ± 2.0	> 0.001*
Pre-pregnancy BMI	21.5 ± 4.1	24.0 ± 2.4	> 0.001*
Parity			
Primigravida	10 (33.3)	12 (40)	> 0.001**
Multigravida	18 (60)	18 (60)	
Grandemultigravida	2 (6,7)	0	
Work			
Employed	22 (73.3)	9 (30)	0.001**
Unemployed	8 (2.7)	21 (70)	

**Unpaired T-Test*
***Mann Whitney test*

Based on Table 1, there were no significant differences in maternal age, MUAC, or pre-pregnancy BMI between the intervention and control groups, indicating that both groups were comparable. Maternal age fell within the normal reproductive range, MUAC values were within the normal range, and BMI was also within the normal range in both groups. There were no differences in parity; however, occupational characteristics differed, with most women in the control group being employed, while the majority in the intervention group were housewives. To further assess differences in VAS scores for quality of life between the intervention and control groups, see Table 2.

Table 2. Differences in VAS Scores of Quality of Life of Pregnant Women Between the Intervention and Control Groups

Quality of Life	Intervention n=30		Control n=30		p
	Median (minimum-maximum)	Mean±SD	Median (minimum-maximum)	Mean±SD	
Day 1	70 (50-80)	69.2 ± 6.3	90 (60-100)	90 ± 10.4	0,000
Day 2	75 (60-85)	73.7 ± 5.1	90 (60-100)	90.7 ± 8.8	0,000
Day 3	80 (70-85)	80.3 ± 3.9	90 (70-100)	92.2 ± 7.8	0,000
Day 4	85 (80-95)	85.8 ± 4.2	92 (70-100)	92.3 ± 7.5	0,000

Mann-Whitney test

Table 2 shows a significant difference in the VAS quality of life scores of pregnant women in the first trimester between the control and intervention groups. Pregnant women receiving standard therapy had higher quality of life scores than those in the intervention group. Therefore, subjects receiving vitamin B6 therapy had a higher quality of life than those in the peppermint aromatherapy group.

Quality of life analysis, in addition to the VAS analysis, was also conducted using the Health Related Quality of Life (HRQOL) questionnaire. The quality of life of pregnant women was measured using a Visual Analogue Scale that asks about the patient's current condition. The score consists of a scale of 0-100 with a score of 0 (very bad condition) and 100 (good condition as before pregnancy). In addition to the Visual Analogue Scale, quality of life was also measured by the Health Related Quality of Life questionnaire. A mother's quality of life is considered good if she is not feels very healthy. Based on HRQOL, Quality of life in the control and intervention groups describe in table 3.

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Table 3. Quality of Life Based on HRQOL in the Control and Intervention Groups

Quality of Life (HRQOL)	Intervention		Control		p
	n	%	n	%	
Day 1					
Good	13	43.3	21	70	.039
Poor	17	56.7	9	30	
Day 2					
Good	16	53.3	24	80	.030
Poor	14	46.7	6	40	
Day 3					
Good	19	63.3	25	83.3	.082
Poor	11	36.7	5	16.7	
Day 4					
Good	22	73.3	24	80	.545
Poor	8	28.7	6	20	
Total	30	100	30	100	

**McNemar test*

Based on Table 3, Health-Related Quality of Life, it is known that there was no difference in quality of life between intervention and control groups in days 1, 2, 3, and 4. The following presents HRQOL in the intervention group.

Table 4. HRQOL Before and After Peppermint Aromatherapy in the Intervention Group

Variables	HRQOL before being given peppermint aromatherapy				Total	p
	Good		Poor			
	n	%	n	%		
HRQOL day 1 After being given peppermint aromatherapy						
Good	7	23.3	6	20	13	0.289
Poor	2	6.7	15	50	17	
HRQOL on the 2nd day after being given peppermint aromatherapy						
Good	7	23.3	9	30	16	0.065
Poor	2	6.7	12	40	14	
HRQOL on the 3rd day after being given peppermint aromatherapy						
Good	7	23.3	12	40	47	0.013
Poor	2	6.7	9	30	11	
HRQOL on the 4th day after being given peppermint aromatherapy						0.002
Good	7	23.3	15	50	22	
Poor	2	6.7	6	20	8	
Total	9	30	21	70	30	

**McNemar test*

Table 4 describes the HRQOL in the intervention group. There was no effect of HRQOL before and on days 1, 2, and 3 after aromatherapy. However, peppermint aromatherapy did have an effect on HRQOL on day 4. HRQOL in the poor pre-test decreased from 50% to 20% after peppermint aromatherapy on day 4. Therefore, peppermint aromatherapy significantly improved

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quality of life on day 4. The following table presents HRQOL in the control group.

Table 5. HRQOL Before and After Standard Therapy Was Given to the Control Group

Variables	HRQOL before standard therapy				p
	Good		Poor		
	n	%	n	%	
HRQOL day 1 After being given standard therapy					
Good	21	70	0	0	0.063
Poor	5	16.7	4	13.3	
HRQOL day 2 After being given standard therapy					
Good	24	80	0	0	0.500
Poor	2	6.7	4	13.3	
HRQOL day 3 After being given standard therapy					
Good	22	73.3	3	10	1,000
Poor	4	13.3	1	3.3	
HRQOL day 4 After being given standard therapy					
Good	23	76.7	1	3.3	0.625
Poor	3	10	3	10	
Total	26	86.7	4	13.3	

**McNemar test*

Based on Table 5, it is known that there was no difference between HRQOL before standard therapy and HRQOL on days 1, 2, 3, and 4. Thus, there was no improvement in the quality of life of pregnant women after standard therapy.

DISCUSSION

Based on our research, the mothers' ages were within the normal reproductive age range, and the maternal MUAC was within the normal range. The BMI of the pregnant women in both groups was within the normal range.

The quality of life of pregnant women after administration of peppermint aromatherapy showed a significant difference in the quality of life scores before administration and after administration on days 1, 2, 3, and 4. The quality of life of pregnant women increased day by day after treatment of peppermint aromatherapy. Assessment of the quality of life in pregnant women is useful for early detection of biophysical and psychological conditions and as baseline data to maintain women's health.[14]

To our knowledge, there has been no research on quality of life after in emesis gravidarum after treated by peppermint aromatherapy. However, in subjects other than pregnant women, the quality of life associated with the use of peppermint aromatherapy has been studied. A double-blind clinical trial of 114 patients was conducted to examine disease-related quality of life. The intervention in patients with functional dyspepsia used a mixture of caraway oil and peppermint oil. This essential oil blend can be used as an alternative therapy with tolerable side effects, thus improving quality of life patient.[15]

Assessing a person's quality of life is subjective. Less than 20% of pregnant women are able to express their mental health to a psychologist. Therefore, healthcare providers must be able to assess the quality of life of pregnant

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women to improve pregnant women's services.[16] There is a complex relationship between maternal physical health, quality of life, depressive symptoms and anxiety. Midwives need to conduct comprehensive assessments of maternal mental health and well-being in midwifery practice. These assessments should be able to detect anxiety and quality of life, and specialized bio-psycho-social care should be offered to mothers experiencing these issues. Comprehensive perinatal mental health services are particularly important for pregnant women from low socioeconomic backgrounds.[17]

Our findings in the control group with standard vitamin B6 therapy showed that the quality of life scores of pregnant women did not differ between measurements before, after the intervention on days 1, 2, 3, and 4, with a mean nausea and vomiting score of 92.4 on day 4. This indicates a good quality of life in pregnant women with vitamin B6 therapy. The benefits of vitamin B6 supplementation, not only relieve nausea and vomiting, but can also relieve symptoms of anemia, avoid congenital abnormalities, and maintain dental health.[18] Vitamin B6 supplementation is associated with a positive effect on birth weight. This was confirmed in a meta-analysis. Doxylamine supplementation was also included in this analysis.[17]

In our study, based on a comparison of the two groups, there was a significant difference in the quality of life of pregnant women in the first trimester in the control and intervention groups, where pregnant women with standard therapy had a higher quality of life score than the intervention group.

Based on a prospective, observational cohort study using a survey instrument at Australia among pregnant women between 9 and 16 weeks' gestation. The study compared pregnant women with and without nausea vomiting. Decreased quality of life was associated with increased severity of emesis. The most commonly used therapies were natural remedies, metoclopramide, ginger, and vitamin B6. Emesis in pregnancy has a significant adverse impact on work function and physical quality of life. [19]

Quality of life analysis, in addition to VAS analysis, is also conducted using the Health-Related Quality of Life (HRQOL) questionnaire. VAS has become a common method for assessing health conditions, both as a stand-alone method and in combination with other assessment methods. Although VAS is widely used in health research, its design has the disadvantage of inconsistent measurements, making it difficult to compare with other studies.[20]HRQoL instruments can be applied in research, clinical practice, and community settings, and to assess which interventions can improve quality of life.[21]

Based on our research, there was no effect of HRQOL before and on days 1, 2, and 3 after aromatherapy. However, peppermint aromatherapy did have an effect on HRQOL on day 4. The poor HRQOL category at pre-test decreased after peppermint aromatherapy on day 4 from 50% to 20%. Therefore, peppermint aromatherapy has an effect on improving quality of life on day 4. Knowledge of peppermint oil's relationship to quality of life in pregnant women is still very limited, but there are studies linking peppermint oil to quality of life in other diseases. A study was conducted with an experimental design and a pretest-posttest control with an intervention of peppermint and lemon aromatherapy inhalation using a diffuser. The study was conducted on 90 children aged 2-12 years undergoing chemotherapy, then observed emesis and quality of life of the patients. The results showed that the use of lemon and peppermint aromatherapy in chemotherapy patients can improve quality of life and relieve symptoms of emesis compared to placebo and control

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groups.[22]Based on other research, it is suspected that cardiometabolic pathophysiology is a key target of the mechanism of peppermint oil administration. Use of peppermint supplementation with a dose twice daily (50 µL) intervention may prophylactically improve cardiometabolic health. Furthermore, peppermint may also be effective in treating anxiety. [23]

In the standard therapy group, there was no difference in HRQOL on days 1, 2, 3, and 4. Therefore, there was no improvement in the quality of life after standard therapy, but there was also no significant decrease. There was no difference in Health-Related Quality of Life between days 1, 2, 3, and 4 between the intervention and control groups.

A quasi-experimental intervention study conducted on 66 pregnant women involved peppermint oil and a placebo (sesame oil). Nausea, vomiting, and anxiety were assessed for one week. The study found that peppermint oil effectively reduced nausea and vomiting without any signs of anxiety after 7 days of twice-daily dosing. [24]

A cross-sectional study was involved women with hyperemesis gravidarum. The sample included 240 pregnant women with hyperemesis. Data collection included a 36-item short health survey, a nausea-vomiting index measurement, and a demographic information form. This was conducted in Türkiye in 2017-2018. Data analysis on the association between complementary therapy use and quality of life revealed limited evidence.[25]

CONCLUSION

Based on HRQOL measurements, peppermint aromatherapy affected the improvement of quality of life on day 4, where HRQOL was in the poor category at pre-test, decreased after peppermint aromatherapy administration on day 4 from 50% to 20%. In the group with standard therapy, HRQOL on days 1, 2, 3, and 4 did not differ. This study has limitations, including the unequal work characteristics between the two groups, which can cause bias in the study, and quality of life was measured within 4 days. Researchers recommend increasing intervention time to more valid result.

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